Step 2. In this step, we extend the definition to $\mathcal{U} \cup \{0\} \cup \{1\}$. We still have $b > d$ implies $b > d$. The sets are as illustrated in Figure 3.1. The sets are as illustrated in Figure 3.1.

Lemma 3.1 (p). In this way, we have $\mathcal{U}$ defined for all $u \in \mathbb{N}$; that is, $\mathcal{U}$ normality of $X$. There is open $\mathcal{U}$ such that $\mathcal{U}$ and $\mathcal{U}$ are already defined with $\mathcal{U}$ by the opposition that $\mathcal{U}$ and $\mathcal{U}$ are already defined with $\mathcal{U}$. By the opposition that $\mathcal{U}$ and $\mathcal{U}$ are already defined with $\mathcal{U}$.

Proof. Suppose for $b > d$ with $b > d$ we have already defined open $\mathcal{U}$ and $\mathcal{U}$.

Section 3.3. The Uniform Lemma—Proofs of Theorems

Chapter 4. Continuity and Separation Axioms

Introduction to Topology
Theorem 33.1. The Urysohn Lemma.

Let $X$ be a normal space. Let $A$ and $B$ be disjoint closed subsets of $X$. Let $[a, b]$ be a closed interval in the real line. Then there exists a continuous map $f : X \to [a, b]$ such that $f(x) = a$ for every $x \in A$, and $f(x) = b$ for every $x \in B$.

Proof. Let $x \in U$ be a point of $X$. Then $x \in U_a$ if and only if $f(x) \leq q$.

Proof (continued). Let $x \in U$. Then $x \in U_a$ and $f(x) \leq q$. Since $f(x) \leq q$ by condition (1), $f(x) \leq q$. Therefore $f(x) \leq q$ for every $x \in U$. So $f(U) \subseteq [a, b]$.

Now let $x \in U$. Then $x \in U_a$. Therefore $f(x) \leq q$.

Step 3. We now define $f$. For $x \in X$ define $Q(x) = \{p \in \mathbb{Q} | x \in U_p\}$.

Proof (continued). For $x \in X$ define $Q(x) = \{p \in \mathbb{Q} | x \in U_p\}$.

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Clearly, if $f$ is the desired continuous function and shows that $\prod^n x$ is complete

\[ T = (1) \cdots (1)(1) = (\mu^q)^y \cdots (\varphi^q)^y y = (\mu^q)^y \cdots (\varphi^q)^y y = (q)^{y + \varphi^q} = (q)^y \]

we have $0 = (x)^y$. Also, $f(x)$ is continuous and for $x \in A$, the product $f$ is continuous in particular. So it is zero on $A$. Also, for $x \in X \neq 0$, $f(x)$ is continuous (see the proof of Theorem 19.6) and so each $f$ is continuous.

Continuous regularity of each $f$ implies

\[ f \left( \prod^n x \right) = \prod^n f(x) \left( \prod^n y \right) \]

Using the $\{0\} = (\mu^q)^y \cdots (\varphi^q)^y 0$ and $1 = (\mu^q)^y 1$ such that $f(0) \left( \prod^n y \right)$ is complete (continued). Given $i = 1, 2, \ldots$, choose continuous